WHAT IS CLAIMED IS:

1. A method of growing an (In,Ga)N layer structure by molecular beam epitaxy comprising the steps of:

a) disposing a substrate in a growth chamber;

b) growing a first (In,Ga)N layer having a first indium mole fraction over the substrate at a substrate temperature of at least 650°C; and

c) varying the rate of supply of indium to the growth chamber thereby to grow a second (In,Ga)N layer having a second indium mole fraction different from the first indium mole fraction over the first (In,Ga)N layer at a substrate temperature of at least 650°C;

wherein the rates of supply of ammonia and gallium to the growth chamber are kept substantially constant during the growth of the first and second layers.

2. A method as claimed in claim 1 and comprising the further step of:

d) varying the rate of supply of indium to the growth chamber thereby to grow a third (In,Ga)N layer having a third indium mole fraction different from the second indium mole fraction over the second layer at a substrate temperature of at least 650°C.

3. A method as claimed in claim 2 and comprising the further steps of:

e) varying the rate of supply of indium to the growth chamber thereby to grow a fourth (InGaN) layer having the second indium mole fraction over the third layer at a substrate temperature of at least 650°C; and

f) varying the rate of supply of indium to the growth chamber thereby to grow a fifth (In,Ga)N layer having the third indium mole fraction over the fourth layer at a substrate temperature of at least 650°C.

4. A method as claimed in claim 1 wherein the substrate temperature during the growth of each InGaN layer is in the range 650º to 800ºC.

5. A method as claimed in claim 1 wherein the molecular ratio of the flow rate of ammonia to the growth chamber to the flow rate of indium and gallium to the growth chamber is selected to be at least 10:1.

6. A method as claimed in claim 5 wherein the molecular ratio of the flow rate of ammonia to the growth chamber to the flow rate of indium and gallium to the growth chamber is selected to be at least 500:1.

7. A method as claimed in claim 1 wherein the molecular ratio of the flow rate of ammonia to the growth chamber to the flow rate of indium and gallium to the growth chamber is selected to be less than 10,000:1.

8. A method as claimed in claim 1 wherein the beam equivalent pressure of ammonia supplied to the growth chamber is greater than 1×10^{-4} mbar.

9. A method as claimed in claim 1 wherein the beam equivalent pressure of ammonia supplied to the growth chamber is equal to or less than 2×10^{-2} mbar.

10. A method as claimed in claim 1 wherein the beam equivalent pressure of indium and gallium supplied to the growth chamber is equal to or greater than 1×10^{-6} mbar.

11. A method as claimed in claim 1 wherein the beam equivalent pressure of indium and gallium supplied to the growth chamber is less than 1×10^{-4} mbar.

12. A method as claimed in claim 1 wherein the second indium mole fraction is greater than the first indium mole

fraction.

13. A method as claimed in claim 1 wherein the first indium mole fraction is zero whereby the first (In,Ga)N layer is a GaN layer.

14. A method as claimed in claim 1 wherein the third indium mole fraction is approximately 0.05.

15. A method as claimed in claim 1 wherein the second indium mole fraction is approximately 0.2.

16. A method as claimed in claim 1 wherein each layer is grown at substantially the same substrate temperature.

17. An (In,Ga)N layer structure grown by a method as defined in claim 1.

18. An (In,Ga)N laser diode comprising an (In,Ga)N layer structure as claimed in claim 17.

19. An (In,Ga)N light-emitting diode comprising an (In,Ga)N layer structure as claimed in claim 17.